



SOUTH LINCS CONSULTING LTD

SURFACE WATER DRAINAGE STRATEGY

PROPOSED NEW HEADQUARTERS BUILDING

At

**PLATTS CLOSE
PINCHBECK
SPALDING
LINCOLNSHIRE**

For:



Document history:

Outline drainage strategy

Ark ICT Solutions, New HQ development at Platts Close, Pinchbeck, Spalding

This document has been issued & amended as follows:

Version	Date	Description	Prepared By	Distribution
1.0	10/03/2020	1 st draft (issued among design team only)	M. Kidd	SLC, O&L, Ark ICT
1.0	11/03/2020	Issued to WDIDB for comment	M.Kidd	WDIDB
1.1	31/03/2020	Amended based on WDIDB comments and submitted for planning.	M. Kidd	SLC, O&L, Ark ICT, SHDC

Distribution List Abbreviations:

SLC – South Lincs Consulting Ltd

O&L – Oglesby & Limb Ltd

Ark ICT – Ark ICT Solutions Ltd

WDIDB – Welland and Deepings Internal Drainage Board

SHDC – South Holland District Council

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- Appendix A: Architectural Site Plans (for planning stage)
- Appendix B: Anglian Water Site Information & Topographical Survey
- Appendix C: Welland & Deepings Internal Drainage Board map

1.0 Introduction

- 1.1 Ark ICT Solutions Ltd are planning a new headquarters development on a plot of land located adjacent to Platts Close, Pinchbeck, nr Spalding in Lincolnshire. South Lincs Consulting Ltd (SLC) have been commissioned to produce an outline drainage strategy for submission to the local authority as part of the planning application.
- 1.2 This report aims to assess how surface water will be managed post completion of the development as well as assessing if a reduction in surface water run-off from the site can be achieved.
- 1.3 The general limitations of this report are as follows:
 - South Lincs Consulting Ltd do not adopt responsibility for guaranteed accuracy of any 3rd party data sources that have been used in compiling the report.
 - The report is based on information available at the time of preparation listed in the document history. Should information become available subsequently, South Lincs Consulting Ltd reserve the right to modify the report accordingly should it be deemed necessary.
 - The information and proposals contained within is to form part of the planning application only. The subsequent detailed design phase will contain full drainage details and routes.

2.0 Site Location

- 2.1 The proposed site is located on a plot of land adjacent to Platts Close in Pinchbeck, Lincolnshire which is located just off the Wardentree Lane Industrial Estate, approximately 1.8 miles north east of Spalding town centre.
- 2.2 The site is centred on Ordnance Survey Grid Reference (OSGR) TF259253 Easting: 525877, Northing: 325376. A site location plan and topographical survey is included in Appendix A.

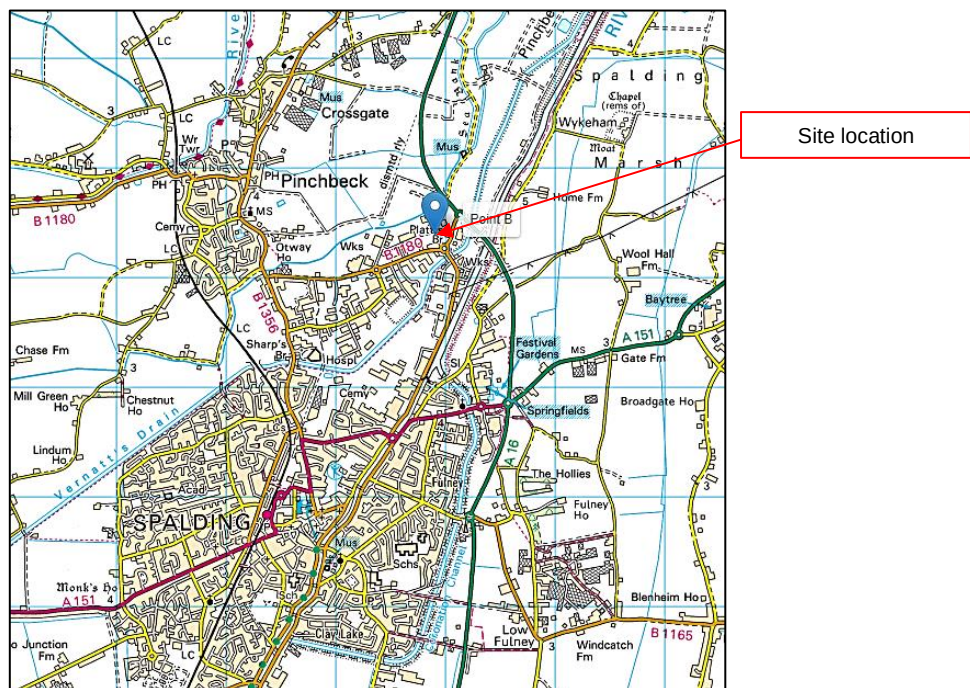


Figure 1: Location on OS map

3.0 Existing Site:

- 3.1 The site is currently unoccupied, situated between a car dealership to the south and an agricultural machinery dealership to the north. To the east there is an office complex containing small businesses as well as a continuation of the car dealership. All neighbouring units are separated by road ways. The west side of the plot will remain as green space but has been earmarked for future development.
- 3.2 Levels on the site (obtained from a topographical survey) indicate that it is relatively flat, with the higher ground being around the site edges. Levels vary from 2.9m AOD to 4.0m AOD with the majority being 3.6m AOD to 3.9m AOD.
- 3.3 Some preliminary ground investigation has been undertaken in the form of CBR testing using a DCP drop hammer rig. The results indicated that the sub-strata (to around 1.5m) is almost certainly sandy gravel. Nearby borehole records from the online British Geological Society (BGS) suggest that there may be an underlying layer of stiff silty clay below this. The Cranfield University Soilscales resource indicates that the land in the area is generally 'loamy and clayey soil of coastal flats with naturally high groundwater'. Further investigation will be carried out when trial pits are dug for the detailed design phase of the project.
- 3.4 Drainage records have been obtained from Anglian Water for the area within which the site is located, as well as a topographical survey undertaken (Appendix B), both indicate the following:
- There are foul and surface drainage runs located underneath the road construction of Platts Close and the adjacent Elsoms Way bounding the north eastern quarter of the site.
 - Running diagonally across the site is a 400mm diameter pipe that contains a potable water supply feeding Spalding town.
 - To the west side of the site are two pumped foul water sewers.
 - A dyke runs along the east of the site (which is to be infilled).
 - There are three water hydrants within the vicinity of the site, one of which is located on the site itself. There is also a public pumping station and electrical sub-station located on Elsoms Way.
- 3.5 There are three water courses located near to the site. Vernatts Drain & The River Welland lie approximately 230m and 500m to the south of the site respectively, while Blue Gowt Drain lies approximately 230m to the north of the site. The two drains are managed by the Welland and Deepings Internal Drainage Board within the Pinchbeck Marsh outfall region of their jurisdiction. The River Welland is a national water way and falls under management of the Environmental Agency.
- 3.6 Existing greenfield runoff rates for the site have been estimated using the IH124 method and are listed as follows:

Annual Probability	Return Period (1 in X years)	Greenfield Runoff Rate* (l/s/ha)	Greenfield Runoff Rate (l/s)
100%	1	1.89	2.18
50%	2	1.93	2.23
3.3%	30	5.14	5.94
1%	100	7.73	8.93

*Total Site Area = 1.15 hectares.

The following parameters were incorporated into the above runoff calculation:

- Total developable site area is 1.155 hectares (from site plans).
- Average Annual Rainfall (SAAR): 610mm/year (taken from MetOffice data)
- WRAP Soil Index: 0.3 (recommended for area)
- Climate Change Allowance (CCA): 1.4 (40% increase)

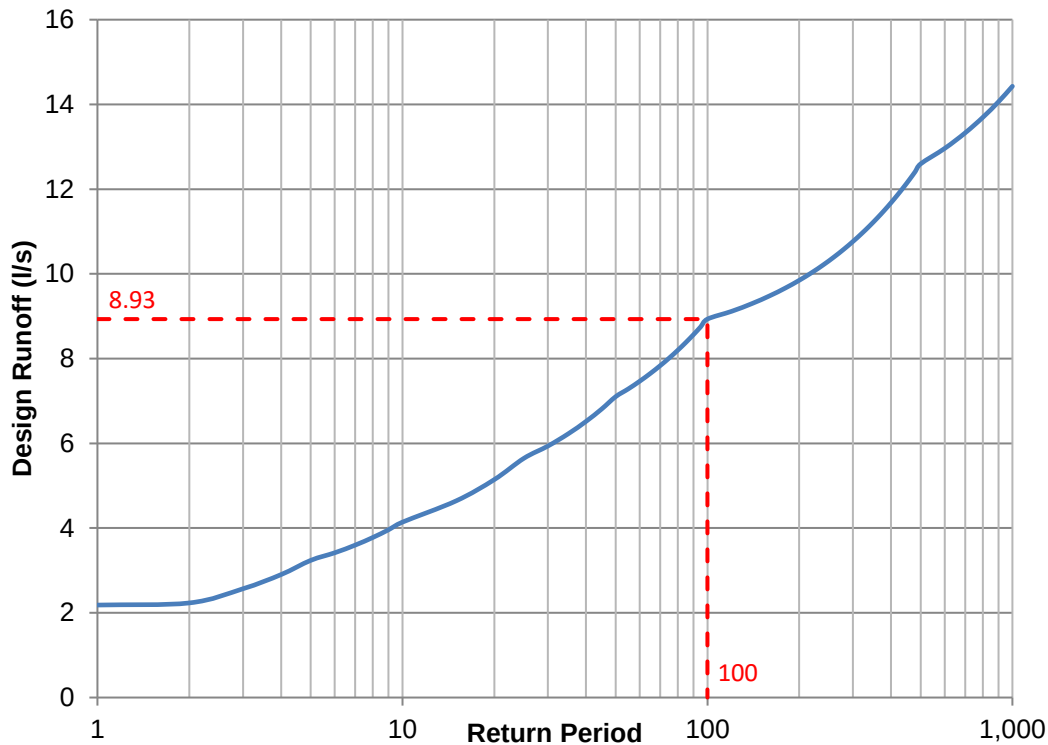


Figure 2: Design surface runoff chart for site, based on greenfield run off rates

- 3.7 The Environmental Agency's Flood Map for Surface Water indicates that the site (not proposed property) has a medium risk of surface flow or ponding, defined as between a 1-3.3% chance annually (1 in 30) taking into account the effect of flood defences in the area. Note that this is the chance of rainfall occurring to cause surface flow or ponding, not the chance of a flood occurring.

4.0 Planning Policy:

- 4.1 The local authority planning guidance in relation to surface water drainage is contained within the South East Lincolnshire Strategic Flood Risk Assessment (SELSFRA) which is published by The South East Lincolnshire Joint Planning Unit (SELJPU) of which, South Holland District Council form a part.
- 4.2 The SELSFRA states that the Environmental Agency are responsible for managing the risk of flooding from main rivers, reservoirs, estuaries and the sea whereas Internal Drainage Boards are responsible for managing the risk of flooding within their own Drainage Districts. Lead Local Flood Authorities are responsible for managing the risk of flooding from surface water, groundwater and ordinary watercourses. The lead local flood authority for the South Holland district is Lincolnshire County Council (LCC).

- 4.3 The National Planning Policy Framework (NPPF) requires that the risk from all sources of flooding is considered and that priority is given to the use of sustainable drainage systems:

'Sustainable drainage systems (SuDs) should be designed to control surface water runoff as close to where it falls as possible to mimic the natural catchment process. The design should aim to reduce runoff by integrating stormwater controls throughout the site in small discrete units rather than using large flow attenuation and flow control structures.'

- 4.4 The National Planning Practice Guidance (NPPG) requires sustainable drainage systems to be provided for all proposed major developments, unless demonstrated to be inappropriate, and states that priority must be given to the use of sustainable drainage systems in areas at risk of flooding. All developments, regardless of scale and constraints, should seek to incorporate sustainable drainage.

- 4.5 The SELSFRA states:

'Generally, the aim should be to discharge surface water runoff as high up the following hierarchy of drainage options as reasonably practicable:

- *Into the ground (infiltration)*
- *To a surface water body*
- *To a surface water sewer, highway drain, or another drainage system*
- *To a combined sewer.'*

- 4.6 The Department for Environment, Food and Rural Affairs (DEFRA) published the 'Non-statutory technical standards for sustainable drainage systems' in March of 2015 which sets out the minimum standards for SuDS. The standards are supported by Lincolnshire County Council.

5.0 Climate Change:

- 5.1 The potential impact of climate change for the lifetime of the development must be considered, based on an allowance in accordance with the SELSFRA.

- 5.2 The SELSFRA states that *'generally commercial development is considered against 75 years, unless otherwise agreed with the planning authority.'* Surface water runoff volumes are calculated including the following allowances:

Applies across all of England	Total potential change anticipated for 2015 to 2039	Total potential change anticipated for 2040 to 2069	Total potential change anticipated for 2070 to 2115
Upper End	+10%	+20%	+40%
Central	+5%	+10%	+20%

- 5.3 At time of writing, the year is 2020, therefore the year to consider against total potential change would be 2095. A climate change allowance of 40% shall be adopted.

6.0 Welland & Deepings Internal Drainage Board Requirements:

6.1 Liaison with Welland and Deeping IDB (WDIDB) confirmed the following:

- There is an existing drainage network that transports water away from the industrial estate the nearby Blue Gowt Drain, which is a WDIDB drain.
- The required IDB greenfield runoff rate for discharge into their system is 1.4l/s/ha.
- Discharge rates greater than the greenfield rate require a commuted sum. The current charge for unattenuated discharge is £57,372 per impermeable hectare of the proposed development.
- The charge is calculated on a prorata basis depending on the proposed litres/sec discharge.
- Any subsequent discharges into the network require the prior consent of the WDIDB.

6.2 Welland & Deepings indicated that, in principal, their drainage network could accept an attenuated discharge from the site. However, this acceptance would be subject to payment of their pro-rata'd commuted rate sum.

6.3 The commuted rate sum is currently applied at the rate of £57,372 per impervious hectare of area that contributes to the IDB drainage network, however, where an attenuated discharge is provided, the commuted sum is pro-rata'd according to the degree of attenuation provided.

7.0 Proposed Surface Water Drainage Strategy:

7.1 The hierarchy of preferred surface water disposal as outlined in section 4.5 is to be adopted, with ground infiltration being the preferred primary option for permeable areas, followed by attenuated discharge to a surface water body for impermeable areas.

7.2 The hierarchy stated in 7.1 is considered below:

Discharge into the ground

7.3 Preliminary ground investigation has revealed that there is likely sandy gravel overlying a stiff silty clay. Further ground investigation work will be undertaken to confirm the presence of the sandy gravel and its layer thickness. In principle, if its presence is confirmed, then the un-paved areas of car-parking and non-developed areas of the site, lend themselves to natural ground infiltration.

Discharge to a surface water body

7.4 The proposed development is located on an industrial estate with nearby WDIDB managed water courses. There is an existing surface water drainage network serving the industrial estate that discharges into these water courses. For impermeable areas of the development, it is the intention to utilise this network with prior attenuation incorporated.

SuDS

- 7.6 The proposed strategy will incorporate the use of SuDS in two ways. As mentioned in 7.4, attenuation will be incorporated. This is likely to be done in the form of an 'egg-crate' style soakaway system prior to discharge into a managed water course. The soakaway system will intercept surface run-off from the impermeable areas of car parking as well as the proposed building.
- 7.7 It is proposed to construct the overflow car-parking area in gravel, which is a permeable material. This will achieve ground infiltration should the immediate underlying strata be confirmed as sandy gravel. The depth of water table is to be established during detailed design, though is not anticipated to be higher than 3m below ground level.
- 7.8 A percolation test for the site will be carried out during the detailed design phase to confirm ground infiltration rates and assist the soakaway design. Should the utilisation of SuDS not be deemed suitable, land drains will need to be implemented to carry surface water to the existing surface drainage network and thus to the Blue Gowt Drain.

8.0 Conclusion

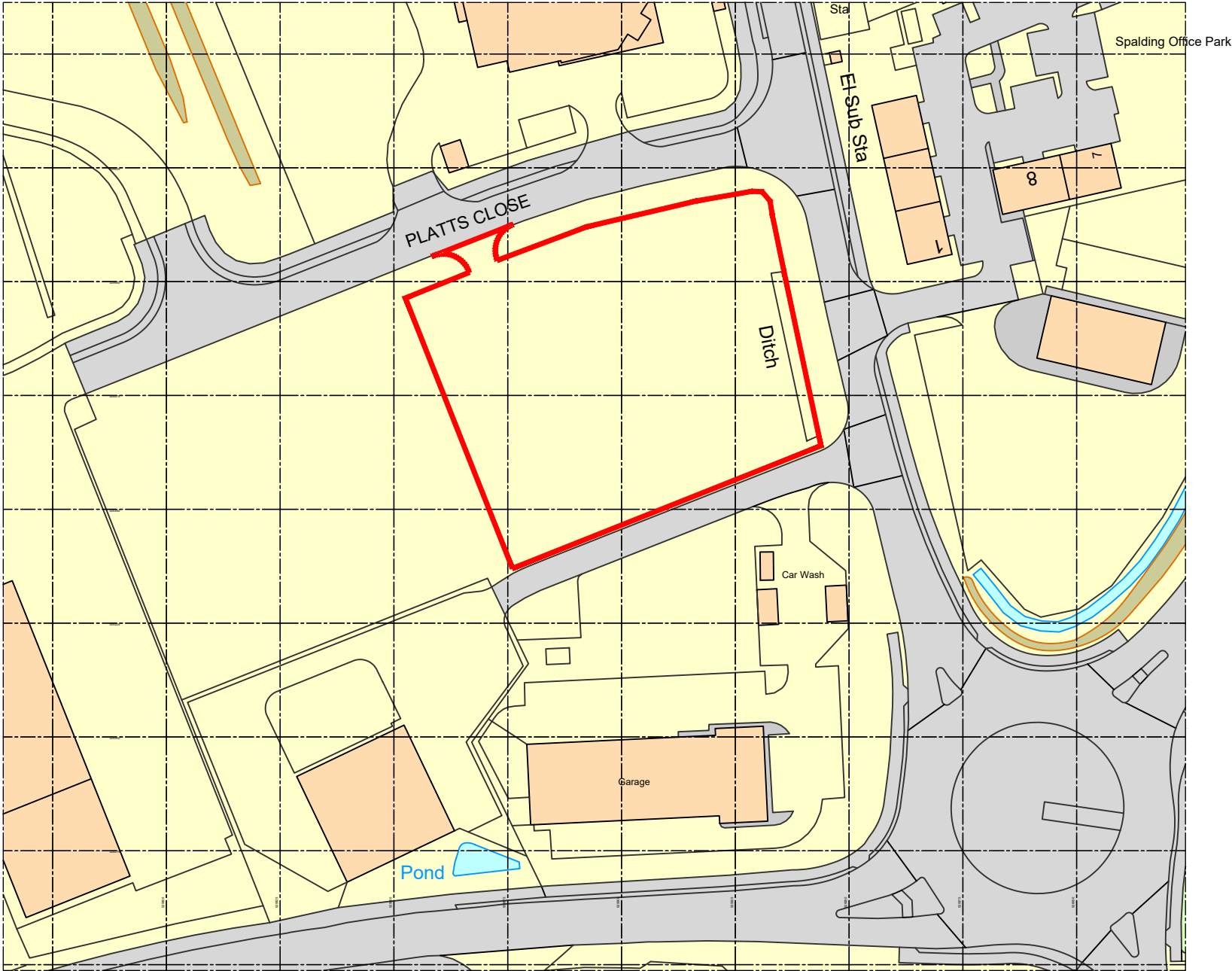
- 8.1 This drainage strategy has been prepared by South Lincs Consulting Ltd on behalf of Ark ICT Solutions Ltd to outline the methodology by which removal of surface water will be achieved and how SuDS will be incorporated as part of the proposed development at Platts Close, Pinchbeck, Nr Spalding, Lincolnshire.
- 8.2 The preferred method of surface water disposal, in general, is to rely on ground infiltration for un-paved & undeveloped areas of the site, while utilising an attenuated discharge to a managed water course for impermeable areas of the site. There is an existing network currently used by the industrial estate to transport surface water away to the Blue Gowt Drain, a WDIBD managed water course. It is the intention to utilise the same network for this development subject to confirmation from the sewer undertaker, Anglian Water Services Ltd.
- 8.3 The managed water course into which the surface water is to be transported is confirmed as The Blue Gowt Drain by Welland & Deepings Internal Drainage Board. The site sits within their jurisdiction under the Pinchbeck Marsh catchment.
- 8.3 The rate and volume of runoff will be controlled and released to the WDIBD network at an attenuated rate for up to and including a 1 in 100 year return period storm event. This rate and volume also incorporate climate change allowances for the lifetime of the development.
- 8.4 It is recommended that the following condition be added to the planning consent:

'Prior to the commencement of the construction phase of the development, a detailed drainage design, including details of attenuation requirements and drainage routes shall be submitted to SHDC & WDIB and LCC for approval. All works shall be undertaken in accordance with these approved details and no work shall be undertaken on site until approval has been granted by both of these parties. '

End of report

Appendix A

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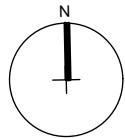
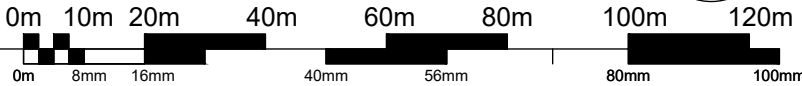
Site Location Plan

Scale 1:1250 @ A3

Site of works proposal outlined in red.

SCALE 1 : 1250

SCALE 1 : 1



-	XX.XX.XX	Xxxxxx	RDL
Ref.	Date	Description	Initial

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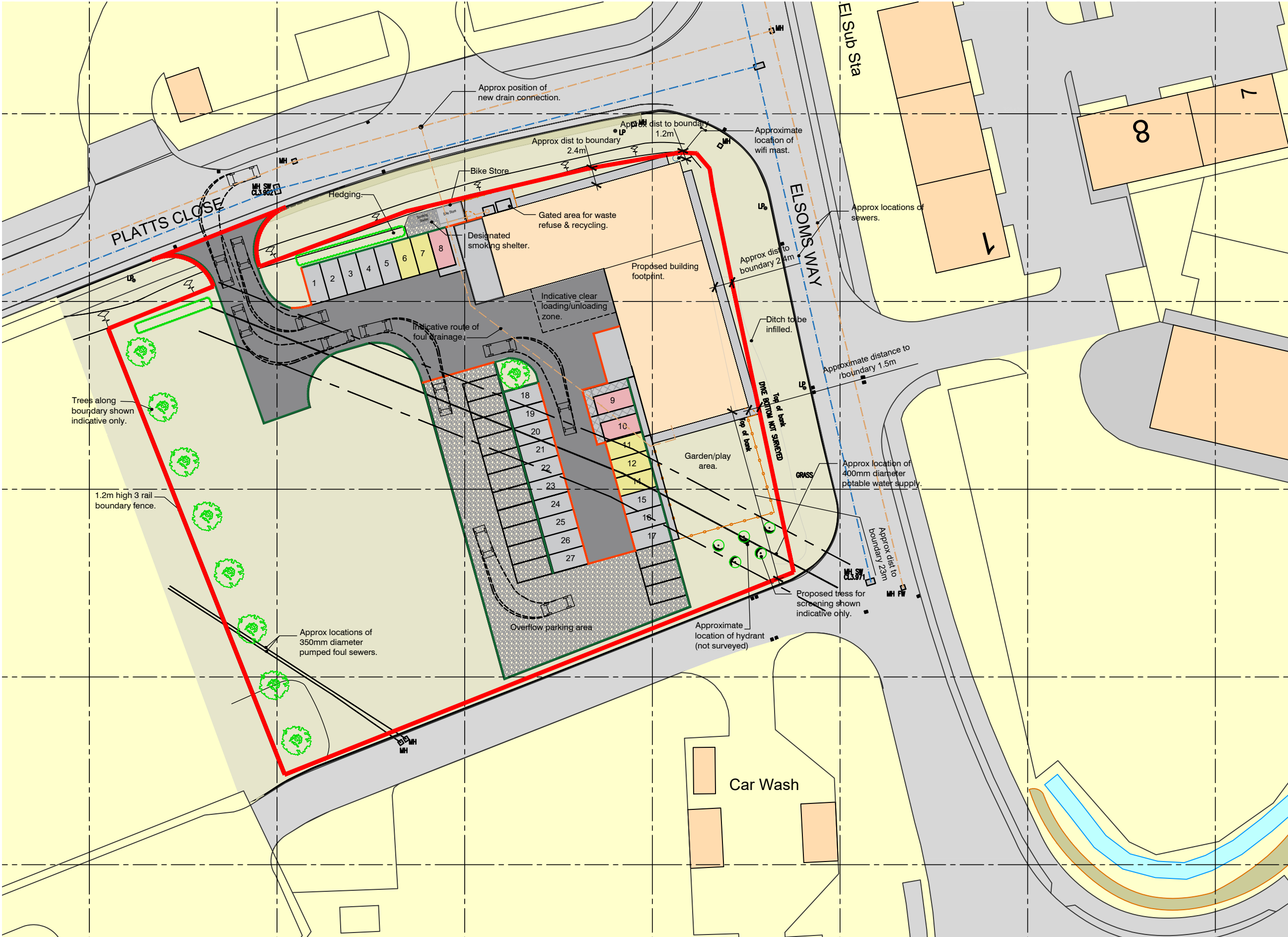
Project:
**Proposed HQ for Ark ICT Ltd
comprising offices, storage,
coffee bar & ancillary areas.**

Drawing Title:
Site Location Plan as existing

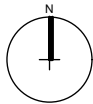
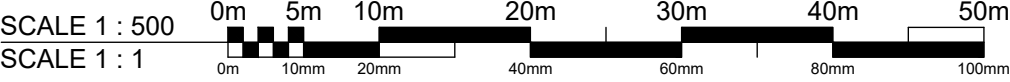
GENERAL ISSUE

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Site Block Plan as proposed
Scale 1:500 @ A3



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- Foul Surface
- Surface
- Tarmac.
- Building.
- Gravel.
- Grass.
- Block paving/slabs.
- Dropped Kerb.
- Kerb.
- Fencing.
- Electric charging.
- Disabled Parking.

-	XX.XX.XX	Xxxxxx	RDL
Ref.	Date	Description	Initial

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Client:
Mr. P. Callow

Project:
Proposed HQ for Ark ICT Ltd comprising offices, storage, coffee bar & ancillary areas.

Drawing Title:
Site Block Plan as proposed

PLANNING APPLICATION ISSUE

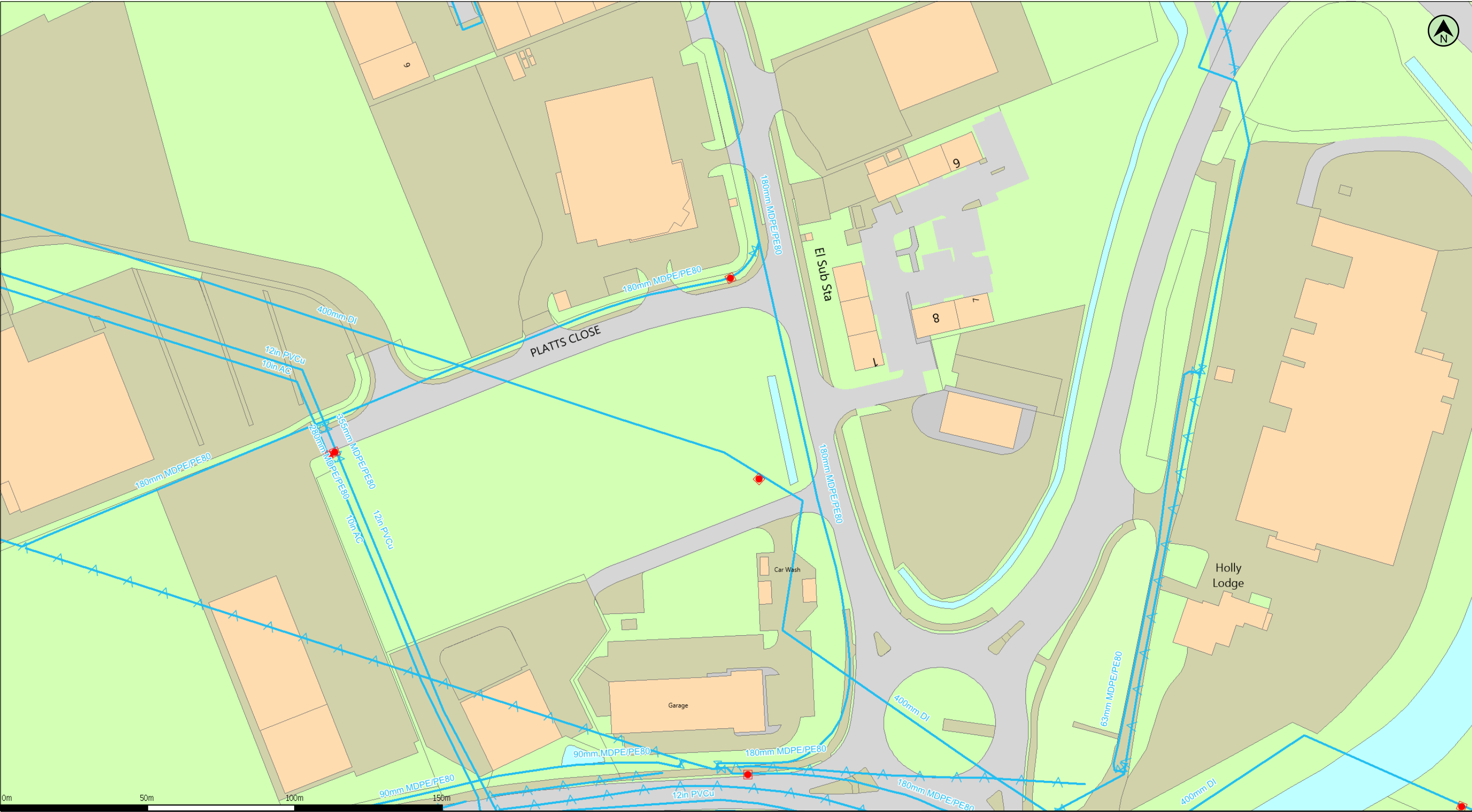
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Drawn by:	RDL	Checked by:	AJO

Drawing Number:	Rev:
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Appendix B

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Potable Water
Raw Water
Decommissioned Water



Fitting



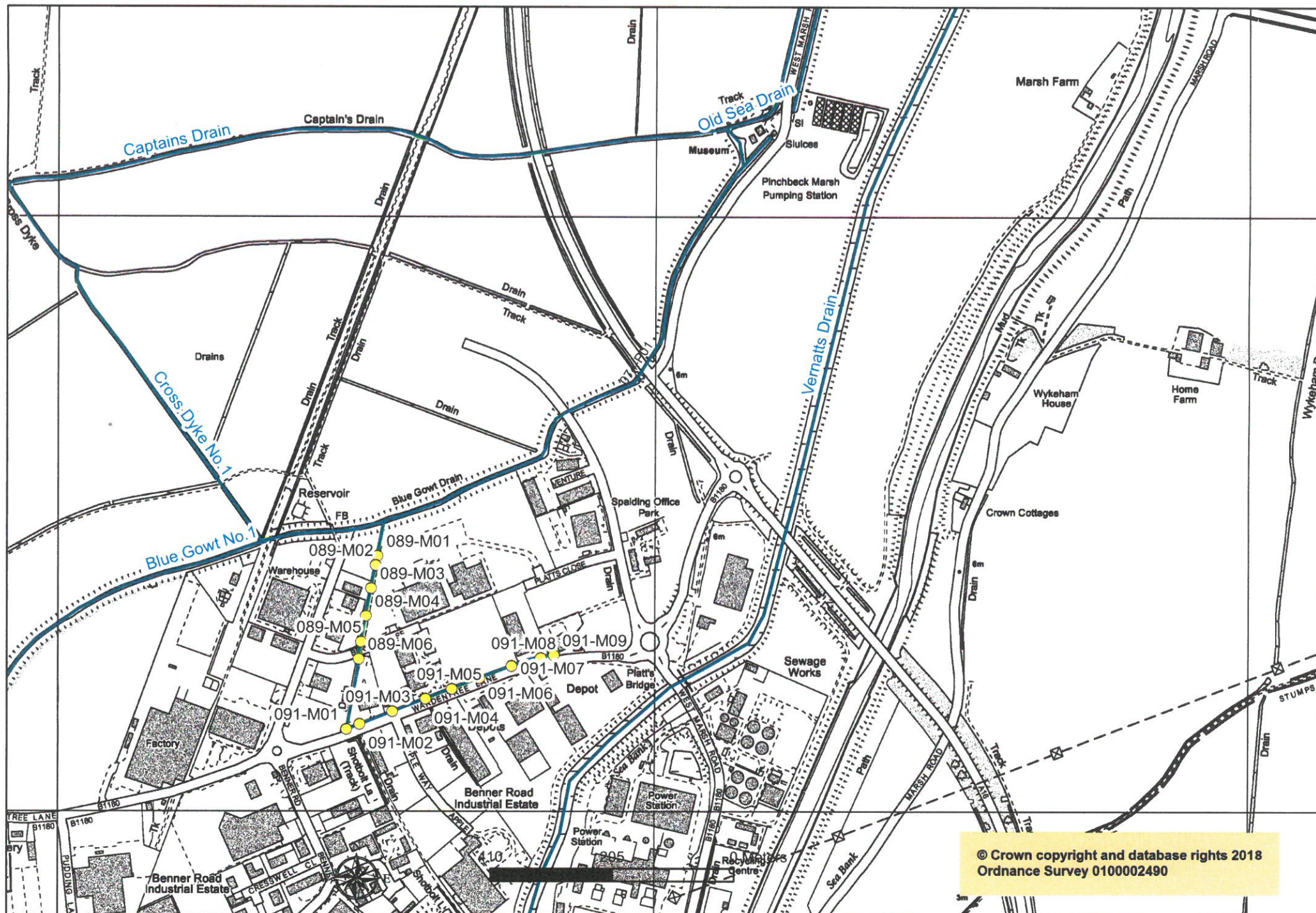
Hydrant



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Platts Close
Platts Close



Appendix C



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End of Document

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